

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: March 24-28, 2008

KQED_TV to feature Lab research on aerogel



It looks like frozen smoke. And it's the lightest solid material on the planet.

Aerogel insulates space suits, makes tennis rackets stronger and could be used one day to clean up oil spills. LLNL scientist Alex Gash will demonstrate some remarkable properties of this truly unique substance on "Quest," KQED-TV's locally-produced science, nature, and environment PBS program.

The show will air Tuesday, April 1, at 7:30 p.m. on KQED (channel 9) and KQED-HD (Comcast channel 709.) It also will be posted on the Quest Website at <http://www.kqed.org/quest/>

Third shipment of special nuclear material leaves Livermore

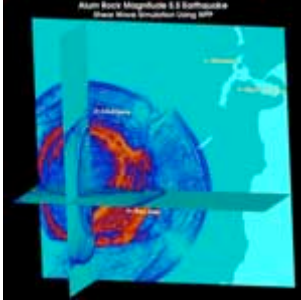


The National Nuclear Security Administration (NNSA) has completed a third shipment of special nuclear material from the Laboratory this week, reducing high-security material onsite by about 25 percent. The material was moved to the Savannah River Site in South Carolina under high security.

"As we've indicated before, we have an accelerated plan to remove special nuclear material from Lawrence Livermore National Laboratory," said NNSA Administrator Thomas D'Agostino.

The shipment is part of NNSA's plan to remove high-security nuclear material from the Laboratory. As part of its Complex Transformation, NNSA plans to consolidate nuclear materials at five sites by 2012. The latest shipment from LLNL was completed in full compliance with existing safety and environmental laws and procedures.

New wave simulations lend a hand in ground response during earthquakes



A 3D graphical representation of the Alum Rock magnitude 5.5 earthquake using a new code on LLNL's BlueGene/L to simulate the shear waves.

It's not always easy to predict when the earth will move under your feet.

But Lab researchers are working on a better understanding of how the ground will respond to strong forces such as fault ruptures through a series of new wave propagation simulations run on some of the Laboratory's supercomputers.

"Earthquakes are likely caused by chaotic processes, which are all but impossible to predict on short time scales, such as hours or days," points out Lab geophysicist and computer scientist Shawn Larsen.

This is the subject of three research papers appearing in the April edition of the *Bulletin of the Seismological Society of America*.

For more information, go to the Web at

https://newsline.llnl.gov/articles/2008/mar/03.28.08_earthquake.php

LLNL gratings on their way to England



Pictured from left: Jerry Britten, James Nissen, Hoang Nguyen, Jim Peterson, Mike Aasen, Tom

Carlson, Cindy Larson and Curly Hoaglan.

LLNL recently sent six gold overcoated gratings to Great Britain's Atomic Weapons Establishment facility in Aldermaston, Berkshire for use in their Orion short-pulse laser.

The Laboratory is the only facility in the world capable of manufacturing gratings of such size and precision. The technology was developed to enable the Nova Petawatt laser in the mid-'90s. Since then, LLNL has built gratings for numerous laser projects around the world.

Multilayer dielectric gratings, a new type of optic developed at LLNL and able to withstand higher laser intensities, are being manufactured on site for the Lab's National Ignition Facility as part of the Advanced Radiographic Capability project.

Miller is awarded for work with state science and technology council



Robin Newmark of the Lab's Global Security Principal Directorate presents Director George Miller with a copy of state resolution for his work as a council member of the California Council on Science and Technology. Newmark has served as the Lab's affiliate on the council.

Director George Miller recently was awarded a copy of a state resolution for his work as a member of the California Council on Science and Technology (CCST).

2008 makes the 20th anniversary of CCST. The Laboratory is one of the six laboratory affiliates. Other affiliates include: Lawrence Berkeley, Sandia, Stanford Linear Accelerator, the Jet Propulsion Laboratory and NASA-Ames. Robin Newmark of the Global Security Principal Directorate serves as LLNL's lab affiliate representative.

The California State Assembly drafted a resolution in recognition of CCST's role and accomplishments and in honor of its 20th anniversary. As a member of the council, Miller was presented with a framed copy of the resolution.

For more information on CCST, go to the Web at <http://www.ccst.us/index.php>.

Pi Day celebrated at Discovery Center



Fifth-grade students from Livermore's Arroyo Seco School demonstrate the energy bike to Albert Einstein (LLNL's Evan Rittmann) at the Lab's Discovery Center on Pi Day.

Students attending the Lab's Super Science field trip recently got to celebrate Pi Day at the Discovery Center with special activities, including a visit by Albert Einstein (LLNL's Evan Rittmann).

March 14 or 3-14 is celebrated annually by math enthusiasts around the world. Pi, Greek letter π , is the symbol for the ratio of the circumference of a circle to its diameter. $\pi = 3.1415926535...$ March 14 also happens to be the birthday of Albert Einstein.

The symbol for Pi (π) was first used in 1737 by William Jones, but was popular after it was adopted by the Swiss mathematician Leonhard Euler in 1737. With the use of computers, Pi has been calculated to more than 1 trillion digits past the decimal. Pi is an irrational number; it will continue infinitely without repeating.

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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